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American Mathematical Society, by F. N. Cole; 'On the foundations of mathematics' (presidential address), by E. H. Moore; 'Concerning the axiom of infinity and mathematical induction,' by C. J. Keyser; 'A German calculus for engineers' (review of Fricke's 'Calculus'), by E. R. Hedrick; Notes; and New Publications.

THE current number of the *American Journal of Mathematics* contains the following articles:

EDWARD KASNER: 'The Double-Six Configuration Connected with the Cubic Surface, and a Related Group of Cremona Transformations.'

SAUL EPSTEIN: 'Untersuchungen über lineare Differentialgleichungen 4. Ordnung und die zugehörigen Gruppen.'

A. N. WHITEHEAD: 'The Logic of Relations, Logical Substitution Groups and Cardinal Numbers.'

JOHN WESLEY YOUNG: 'On a Certain Group of Isomorphisms.'

F. E. ROSS: 'On Differential Equations Belonging to a Ternary Linearoid Group.'

THE April Number of the *Biological Bulletin*, Volume IV., No. 5, contains the following articles:

EDMUND B. WILSON: 'Notes on Merogony and Regeneration in *Renilla*.'

CARL H. EIGENMANN and CLARENCE KENNEDY: 'Variation Notes.'

WALTER S. SUTTON: 'The Chromosomes in Heredity.'

HENRY LESLIE OSBORN: 'On *Phyllodistomum americanum* (n. sp.); a New Bladder Distome from *Amblystoma punctatum*.'

THOS H. MONTGOMERY: 'The Heterotypic Maturation Mitosis in Amphibia and its General Significance.'

BASHFORD DEAN: 'An Outline of the Development of a Chimæroid.'

SOCIETIES AND ACADEMIES.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

It is a pleasure to record that the Academy of Science of St. Louis, which has thus far in its existence met as a tenant or guest, is now in possession of a home of its own in which it will probably be installed before the end of the current year.

Some months since, Mrs. Eliza McMillan and her son, Mr. William Northrop McMillan, offered to purchase for the academy a piece of property on Olive Street between Spring and Vandeventer avenues, in what is now coming to be the central district of St. Louis, as a memorial to the late William McMillan, who, at the time of his death, was a member of the academy. The transfer has now been effected and was announced by the council at the regular academy meeting of April 6, on which occasion the following resolutions were unanimously adopted:

"RESOLVED, That the members of the Academy of Science of St. Louis most gratefully accept from Mrs. Eliza McMillan and Mr. William N. McMillan, the gift of a permanent home for the academy. We feel that this generous donation will infuse new life into the institution and will insure its future usefulness. We pledge ourselves to use every effort to make it worthy of the confidence thus shown by the donors and to maintain the object of its founders, as expressed in the Act of Incorporation—'the advancement of science and the establishment in St. Louis of a museum and library for the illustration and study of its various branches.'

"RESOLVED by the members of the Academy of Science of St. Louis, that the property conveyed on the 18th day of March, 1903, by Edgar R. Hoadley and Luvinia L. Hoadley to the Academy of Science of St. Louis, which property is the gift of Mrs. Eliza McMillan and William N. McMillan, shall not be mortgaged or encumbered so long as it remains the property of the Academy of Science.

"RESOLVED, further, that the property shall not be sold except by a two thirds vote of the members of the Academy of Science of St. Louis by letter-ballot in the manner prescribed by the council, and that when sold, the proceeds of the sale, or as much thereof as may be necessary, shall be used to provide a suitable location and building for the uses of the Academy of Science."

In introducing the foregoing resolutions, Professor Nipher, long a member of the academy and for a considerable period its president, said:

"I can not allow this occasion to pass without calling attention to the great significance of the announcement which has been made this evening.

"Ever since the academy was organized, in

March, 1856, its work has been done under the most discouraging circumstances. It has never had a home. Its meetings have been held in the meeting-room of the Board of Education, at a medical college, at Washington University, and in the rooms of the Missouri Historical Society. It has never had its own home, where it might make its valuable library and its collections of real service to the citizens of our city. During all these years of its existence the academy has been collecting a library of scientific publications, in exchange with similar societies in all parts of the world. Our published *Transactions* have gone to every civilized land. We have certainly had the outward semblance of great scientific activity. There is no local academy of science in this country which can present a more creditable record of published work. Even during the Civil War, when almost every educational interest suffered, a few working investigators, aided by others who gave such support as they could give, continued to produce before this body their contributions to knowledge, and to publish them to the world in the *Transactions* of the academy.

"During all of this time these pioneers have been hoping to see this day. Year after year the president's annual report has called attention to the vital necessity of a fixed abiding-place which we could own and control. Without this we could never hope to establish a public museum of science, or to avail ourselves of our precious library.

"And now the first great advance has been made. This gift to the cause we have been striving to uphold could not have been more opportune. These enlightened patrons of higher learning have seen their opportunity, and they have volunteered their aid. The manner in which they have bestowed their bounty makes it doubly valuable and effective. They have made it impossible for us to honor them by any act within our power. They have become one with us in the cause which we have all labored to advance. May we not hope that they will permit us to enroll their names in our membership as patrons of the academy?

"And this gift brings with it new obligations for us. We should now seek to establish an endowment fund, which will enable us to make our valuable collections of books and specimens fully available to the public. During the World's Fair we shall be under examination. Learned men from this and other lands will come among us. The great public will be here. The location of our new home is such that we can not fail to attract

the attention of vast numbers of our visitors. We should not only have a museum and library which will be an honor to our city, but it should be open to all. We wish to show that we have here, among the permanent institutions of our city, an academy of science which is dedicated to the advancement of human learning, and to the diffusion of knowledge among men. In this way we shall fittingly carry out the work which Mrs. William McMillan and her son, Mr. William Northrop McMillan, have so nobly begun."

On nomination of the council, Mrs. McMillan and Mr. W. N. McMillan were elected patrons of the academy.

WM. TRELEASE,
Recording Secretary.

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 369th meeting was held Saturday, March 21.

T. S. Palmer told of 'The Preservation of Pelican Island as a Breeding Ground for Birds.' He said that this islet situated in Indian River, Florida, was the only place on the east coast where the brown pelican bred, and that the Audubon Society had for some time been endeavoring to secure it. It had been found that the necessary legal proceedings would require some two years' time and that the spot might, after all, be secured by another party; at the request of the Secretary of Agriculture it had been made a government reservation, one of the very few cases on record where such a step had been taken to preserve the birds.

Walter H. Evans drew attention to some deficiencies in 'The International Catalogue of Scientific Literature,' stating that in examining the volume containing the bibliography of bacteriology he had found that only a very small portion of such papers published in the United States had been recorded. He cited a number of journals whose articles had been entirely or partially omitted, and said that, on the other hand, papers were included in the catalogue that could only by courtesy be considered as bacteriological in their nature.

Vernon Bailey spoke of 'The Desert Life of Western Texas,' illustrating his remarks with views showing the characteristic features

of the flora and fauna of the region; and Paul Bartsch presented some 'Notes of the Herons of the District of Columbia.' He described at some length a colony of night herons, showing various views of the nests with eggs and young in various stages, and also exhibited some pictures of young blue herons and of the great white egret, expressing his regret that these birds had subsequently been nearly all killed by hunters.

F. A. LUCAS.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the 140th meeting of the society, held in the assembly hall of the Cosmos Club, Wednesday evening, March 11, 1903, the following program was presented:

Mr. A. J. Collier, 'Coal-bearing Series of the Yukon.'

About 9,000 tons of coal have been mined along the Yukon since 1897. Above the Tanana the coal occurs in small Eocene basins surrounded by older rocks. Below the Tanana a coal-bearing formation, called the Nulato sandstone, is exposed almost continuously for 400 miles. From the lowest beds of this series cycads of Jurassic and Lower Cretaceous aspect were obtained in the same matrix with dicotyledons of Upper Cretaceous aspect. In other places Upper Cretaceous plants and invertebrates and Eocene plants were obtained, but the horizons could not be differentiated stratigraphically or lithologically, and continuous sedimentation from the Middle Cretaceous to the Upper Eocene is suggested. The Nation River coal bed on the upper Yukon may be either Permian or Eocene overthrust by Permian limestones.

Mr. Frank C. Calkins, 'Soils of the Wheat Lands of Washington.'

The soil covering the higher portions of the Columbia plains has generally been considered to be residuary, and derived from the underlying Miocene basalt. Recent observations, however, have led the author to believe that this soil is an eolian deposit. The argument for the eolian hypothesis is based on the physical and chemical properties of the soil and the complete lack of transition between it and the underlying rock. The wind-blown

material is supposed to come from the soft volcanic sediments that overlie the basalt in the southern portion of the Columbia plains.

Dr. H. S. Washington, 'The Calculation of Center-points in the Quantitative Classification of Igneous Rocks.'

After briefly explaining the main features of the new classification (see SCIENCE, February 27, 1903, pp. 341 et seq.), the speaker showed that, as the classification is strictly quantitative, the theoretical chemical and normative composition of the center-point of any given classificatory division could be calculated mathematically. This is accomplished by forming equations expressing the definition of the center-point of each successive classificatory division, from the solution of which the norm is obtained. From this the chemical composition follows. The method will be explained at length in a publication which is soon to appear.

The result of a calculation of the average igneous rock, based on nearly 2,000 reliable analyses, taken from a collection which has been made by the speaker, was also communicated. It was shown that this latest estimate approximates very closely to those of Clarke and Harker.

Professor Edward Mathews, 'The Practical Working of the Quantitative Classification.'

The author presented the salient features of the new classification as indicated by the averaging of some 500 analyses according to subranges, ranges, orders and classes. The figures seem to indicate that the new rules are applicable with little or no subjectivity, but that little can be told with certainty regarding the classificatory position from an inspection of the chemical analysis.

The author commended the simplicity of the basal conceptions and the resulting simplicity of definitions; the suggestion of new lines of investigation developed by the classification; and the mnemonic features of the nomenclatures. He, however, criticized the choice of order names and roots, the subordination of texture, the fact that the literature would be deprived of its usefulness and the extreme emphasis likely to be placed on chemical analyses of single specimens.

The conclusion drawn by the author was on the whole favorable to the new scheme and the thought was expressed that the new classification more or less modified would bear the same relation to the present nomenclature as the scientific system in botany does to the popular plant names.

W. C. MENDENHALL,
Secretary.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 563d regular meeting was held February 14, 1903.

Rev. J. G. Hagen, S.J., of Georgetown University, spoke of 'A Peculiar Type of Temporary Stars,' the variation of which is so short in duration that it can not be confirmed by an independent second observer. The speaker enumerated and explained five instances of this character, and showed that the authorities in each case were of such weight that the existence of this type can no longer be doubted. The five instances contained two that had been known for many years, but had been accepted with great reserve. Another was published a few months ago; one was taken from unpublished manuscripts of the late E. Heis, and the last was an observation of Christoph Scheiner, S.J., in 1612, which has never been fully studied or understood. The latter especially deserved to be entered in the catalogues of variable stars as well as any other temporary star.

The next paper, by Mr. C. W. Waidner, of the Bureau of Standards, was 'A Discussion of the Practical Methods of Measuring Temperature and the Accuracy attainable by these Methods.' The paper contained a brief outline of the present state of mercurial thermometry in the range -35°C. to $+550^{\circ}\text{C.}$, and of the development of suitable kinds of glass for thermometric purposes; some applications of platinum thermometers, thermoelectric and specific heat pyrometers, to the measurement of temperatures, the accuracy and limitations of each of these methods; the estimation of temperatures beyond the range of these methods, *e. g.*, that of the electric arc,

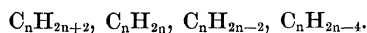
the Nernst filaments, etc., by extrapolation of Stefans's and Wiens's radiation laws.

CHARLES K. WEAD,
Secretary.

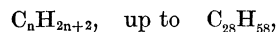
AMERICAN CHEMICAL SOCIETY. NORTHEASTERN SECTION.

THE forty-third regular meeting of the section was held at the 'Tech. Union,' Massachusetts Institute of Technology, Boston, Tuesday, March 31, 8 P.M., President A. H. Gill in the chair. About 45 members were present.

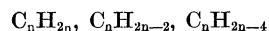
Professor Charles F. Mabery, of the Case School of Applied Science, Cleveland, Ohio, presented a paper, entitled 'A Résumé of the Composition of Petroleum,' in which, after a historical introduction of the subject, the lecturer stated that the subject had occupied his attention during the last twenty years, during the last ten of which, with the aid of grants by the American Academy of Arts and Sciences from the C. M. Warren Fund, and the facilities of the chemical laboratories of the Case School, he had been able to employ a corps of assistants that has made possible the vast amount of labor necessary in distilling, analyzing and otherwise identifying the constituents, distilling below 350° degrees to 450° degrees in petroleum from the field in Pennsylvania, Ohio, Indiana, Texas, California, Japan and South America. As a result of this work, it appears that the portions of petroleum distilling below the limits mentioned are composed of the series



The sandstone oils, such as the Pennsylvania deposits, contain the continuous series

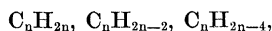


and doubtless higher, but this is the limit of possible molecular weight determinations at present. Ohio Trenton limestone oil contains members of this series up to and including $\text{C}_{11}\text{H}_{24}$, and also the so-called solid paraffine hydrocarbons; but the series



form the greater portion of the Ohio oil. Associated with the solid paraffine hydrocarbons are liquid bodies of the series C_nH_{2n} and $\text{C}_n\text{H}_{2n-2}$ in smaller proportions.

Petroleum from the corniferous limestone in Canada resembles Ohio petroleum in containing the series C_nH_{2n+2} , up to $C_{11}H_{22}$, but this oil contains larger portions of the heavier series



which explains its higher specific gravity. In Texas and California petroleum the series C_nH_{2n+2} does not appear, and the main body of the oil is composed of the series poorer in hydrogen.

As a result of the above investigations, petroleum can be defined as a mixture of a few series of hydrocarbons, and products from different fields differ only in the proportions of the series contained in them. A great field for chemical research yet remains in ascertaining the structure of the series described above, and of the so-called asphaltic hydrocarbons, which can not be distilled without decomposition. The composition of the oil from different fields should have an important bearing on the question of the formation of petroleum, and there is a field for the chemical geologist to study, more intimately than has yet been done, the occurrence of petroleum in connection with its composition.

ARTHUR M. COMEY,
Secretary.

IOWA ACADEMY OF SCIENCES.

THE seventeenth annual meeting of the Iowa Academy of Sciences was held in Des Moines, December 30 and 31, 1902.

The following papers were presented at the sessions:

'Living Plants as Geological Factors,' by B. Shimek. This was a discussion of the influence of living plants in checking erosion and thus overcoming in part the destructive action of running water. Their constructive effect was also considered, and examples were given of their influence in the formation of new deposits by serving as an anchorage for materials brought from a distance. Plants are believed to have been important factors in the formation of the loess. There is much evidence that the loess was deposited by the wind upon plant covered land surfaces.

'The Solar Surface During the Past Twelve Years,' by David E. Hadden. This paper was a review of a series of sunspot observations made by the writer from 1890 to 1902. Daily observations were taken, usually about noon in the autumn and winter and between seven and eight o'clock in the morning during the warmer season. During the period under review about 1,750 groups were observed on the visible disk, the greatest number, 285, being registered in 1893, and the least number, 18, in 1901.

'The Origin of the Lignites of North Dakota,' by F. A. Wilder. All the workable lignite beds of North Dakota are regarded as being of Laramie age. The beds of this age consist mainly of clays which are not fissile or shale-like, and the lignite is interstratified with these clays. The lignite is believed to have been formed in fresh-water lakes which originated during the Rocky Mountain uplift and were fed by streams coming from the west. These rapidly flowing streams would carry much timber and deposit it in the lakes, thus giving rise to the vegetable accumulations which produced the lignite.

Other papers presented were the following:

H. E. SUMMERS: Presidential address, 'Some Problems of Heredity and Evolution.'

L. H. PAMMEL: 'Some Ecological Notes on the Vegetation of the Uintah Mountains.'

FRANK L. ALMY: 'Some Observations upon the Action of Cohers when Subjected to Direct Electromotive Force.'

HOWARD E. SIMPSON: 'The Accretion of Flood Plains by Means of Sand Bars.'

B. H. BAILEY: 'The Duck Hawk (*Falco peregrinus anatum*) in Iowa.'

H. W. NORRIS: 'The Membrane Bones in the Skull of a Young Amphiuma.'

A. N. COOK: 'The Preparation of Phenylether.'

A. N. COOK and W. J. MORGAN: 'The Sioux City Water Supply.'

C. R. KEYES: 'Significance of the Occurrence of Minute Quantities of Metallic Minerals in Rocks.'

C. R. KEYES: 'Genesis of Certain Cherts.'

J. B. WEEMS and ALICE W. HESS: 'The Chemical Composition of Nuts as Food.'

J. B. WEEMS and E. C. MYERS: 'The Preparation of Ammonia-free Water for Water Analysis.'

T. E. SAVAGE: 'The Toledo Lobe of Iowan Drift.'

T. J. and M. F. L. FITZPATRICK: 'The Scrophulariaceæ of Iowa.'

L. H. FORD: 'Smallpox in the Public Schools.' 'Notes from the Chemical Laboratory of Cornell College.'

W. E. SANDERS: 'A Study in Psychopathic Heredity.'

The membership of the academy was increased by the addition of the following fellows: T. C. Frye, D. W. Morehouse, H. C. Price and B. C. Lanphear; the new associate members are Lucy M. Cavanagh, Harriet Clearman, Fred Seaver, A. M. Allen and R. E. Buchanan.

The newly elected officers are:

President—B. Fink.

First Vice-President—S. W. Beyer.

Second Vice-President—Maurice Ricker.

Secretary—A. G. Leonard.

Treasurer—H. W. Norris.

A. G. LEONARD,
Secretary.

THE KELVIN PHYSICAL CLUB OF THE UNIVERSITY OF PENNSYLVANIA.

THE club met on Saturday, February 28, in the Randal Morgan Physical Laboratory and listened to a paper by Mr. Homer M. Derr, on 'Chromatic Interference with Thin Section of Doubly Refracting Crystals in Polarized Light.' The paper contained in brief the theory of the colors of thin rock sections as seen through a polarizing microscope and discussed the practicability of using the same as a means of analysis when chemical action was insufficient to detect certain minerals.

Mr. Derr is constructing a table of the colors up to the fourth order of different minerals with varying thicknesses for qualitative analysis in petrology.

At a meeting of the club on March 7, a paper was presented by Mr. J. Frank Meyer, which reviewed the history of electric convection from the beginning to its present culmination in the dispute between Crémieu and Prender. There was a full attendance at the meeting.

JOS. H. HART,
Secretary.

DISCUSSION AND CORRESPONDENCE.

WILL-MAKING.

TO THE EDITOR OF SCIENCE: Professor Chamberlain's suggestion in SCIENCE, March 6, page 391, that wills should be probated during the lifetime of the testator, has been frequently made to legislatures and just as frequently rejected. It was one of the matters considered and rejected by the judges' committee in the recent revision of Colorado probate law.

In the first place, the suggestion assumes that will disputes and the so-called 'breaking of wills' are matters of very common occurrence, which, though a popular supposition, is to those whose business is the administration of probate law known to be entirely incorrect. An attack upon a will is the exception, and a successful attack even vastly rarer. The few cases of rejected wills are published far and wide in the newspapers, while the thousands admitted to probate without contest never are heard of by the public, creating an erroneous impression. I have had personal knowledge of hundreds of wills, and while I have heard of such instances and read of them in the newspapers and judicial reports, yet have never personally known of refusal to admit a will to probate, except in a few cases in which the paper was not attested by the proper number of witnesses. During the last year I have been constantly in communication and conference with other judges having probate jurisdiction and with probate lawyers, and have found that to be the common experience. If men fail to have their wills witnessed by the statutory number of witnesses, they would be as apt to fail to probate them during lifetime, as it would be only another means of having them witnessed. Then, too, the tendency would be to discourage wills by making the process more complicated, and making it impossible in cases where the testator is far from court and physically unable to travel, or when death is imminent and time, therefore, limited. Furthermore, the question of its construction and effect could not be properly and safely determined by the court in a purely *ex parte* proceeding, and if it could, in many cases a decree thus drawn without a knowledge of the future would itself often come up for construction later on.